

Joint Conflict and Tactical Simulation (JCATS) at Sandia National Laboratories

Description

Joint Conflict and Tactical Simulation (JCATS) is a combat simulator that aids in analysis and training for site security. JCATS is used by various military and government security agencies. This computer-based constructive simulation has “humans in the loop” to allow decision-making by the facility participants. Validation and/or sensitivity simulations of weapons facilities and tactics can be conducted. SNL analysts work with on-site facility personnel

- to derive security information, particularly the probability of neutralization (P_N),
- to perform parts of a facility Vulnerability Analysis,
- to analyze security for proposed design of sites, and
- to provide training for any site, including theoretical sites.

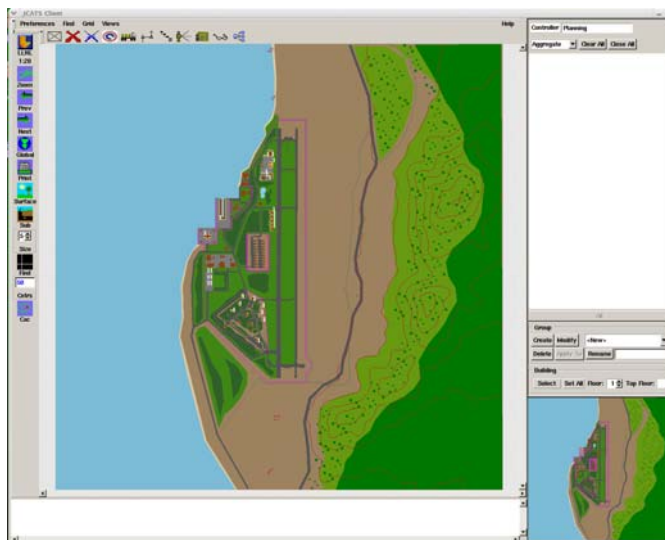
Capabilities

JCATS capabilities include the following:

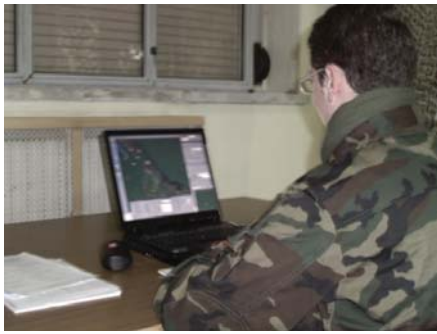
- Human operators emulate tactical force responses
- Computer-based methodology provides objective results
- Realistic terrain models use satellite imagery and elevations with depictions of an actual facility
- High-resolution, entity-level facility and response characteristics, including response personnel, vehicles, aircraft, and watercraft
- Realistic modeling of troop capabilities
- All standard weapons and munitions modeled using actual military and Department of Energy test data
- Data collection to gather and retain information electronically for post-simulation analysis



Training classroom with interactive display



Example of JCATS User Interface showing a sample facility with elevations

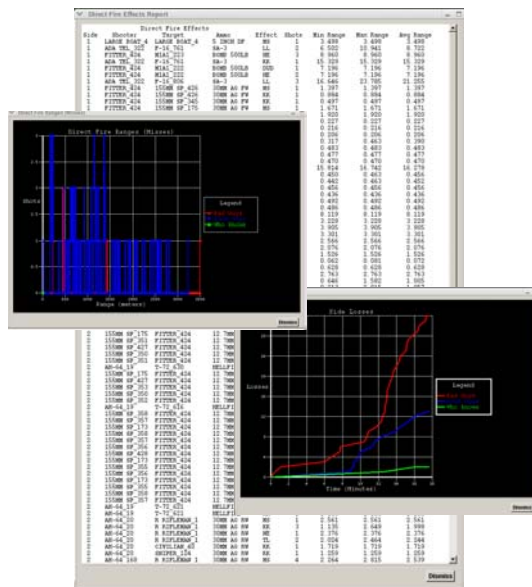


Site personnel train on JCATS before simulations begin

Sandia's Contribution

Sandia provides the following capabilities:

- Experienced operators and project leads with decades of simulation knowledge and skills
- Capability to customize JCATS's operational functionality to meet each site's unique needs and requirements
- Documented, rigorous analysis methodology process to provide detailed after-action analysis and reporting
- Mobile systems—ability to perform on-site simulations
- Diverse, multi-agency customer base
- Wide base of in-house subject matter experts that provide resources and analysis



JCATS reports assist in simulation result analysis

Sandia's Process

The fully trained Sandia staff utilize a thorough planning process to ensure that all customer data are collected for implementation in the JCATS model. The team develops detailed terrain maps of the site. All forces, including both adversary and response, are detailed to include information such as force numbers, resources, weapons, and concepts of operations (CONOPS). Scenarios for analysis are carefully determined.

The analysis then begins, using JCATS trained operators to simulate response and adversary personnel. The operators follow actual tactics dictated by the response force commanders and adversary leaders. Each scenario is conducted multiple times to identify trends. Real-time data are collected.

After the simulations are completed, the real-time and JCATS-produced data are analyzed and results are given to the customer.

Analysis Benefits

Sandia's JCATS capabilities provide the following benefits:

- Greater accuracy than mathematical models
- Multiple scenarios with multiple iterations can be tested and conducted
- Event realism
- New equipment and tactics can be tested easily
- Lower cost than actual force-on-force exercises
- Ability to replay scenarios for after-action review
- Extensive data analysis to guide security decision-making
- Insights into security for training of site personnel

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

11/2006